What is claimed is:

1. An inductor comprising:

a nonconductive, tubular form having an outer surface and defining a tube axis, said outer surface formed with a groove extending substantially helically about said tube axis; and

a coiled wire formed with a plurality of turns for passing an electrical current therethrough, said wire being wound around said form with at least a portion of said wire disposed in said groove to maintain a predetermined separation between adjacent turns during a generation of magnetic forces created by electrical currents passing through said wire.

2. An inductor as recited in claim 1 wherein said form is made of an epoxy – glass composite.

3. An inductor as recited in claim 1 wherein said groove has a substantially rectangular shaped cross-section.

4. An inductor as recited in claim 1 further comprising a means for cooling said wire.

5. An inductor as recited in claim 4 wherein said cooling means comprises:

a shroud for establishing a volume with at least a portion of said wire positioned in said volume; and

a fan for passing air through said volume to cool said wire.

6. An inductor as recited in claim 1 wherein said wire extends from a first end to a second end and said inductor further comprises a first clamp mounted on said form for clamping said first end and a second clamp mounted on said form for clamping said second end.

7. An inductor as recited in claim 6 wherein said tube is formed with a cylindrical inner surface; said inner surface is distanced from said tube axis by a radial distance, R; said first end is clamped by said first clamp at a first clamping point distanced from said tube axis by a radial distance, r, with r > R.

8. An inductor as recited in claim 7 further comprising a saddle made of a non-magnetic material for mounting said first clamp to said form.

9. An inductor as recited in claim 8 wherein said saddle is made of a stainless steel.

10. An inductor as recited in claim 8 further comprising an insulating member affixed to said saddle for attaching said saddle to a mounting plate.

11. An inductor comprising:

a coiled wire formed with a plurality of turns for passing an electrical current therethrough; and

a form having a wall formed with a groove extending partway through said wall, with said wire being disposed in said groove to at least partially expose said wire to a volume surrounding said form to cool said wire, said groove being dimensioned for holding said wire to maintain a predetermined separation between adjacent turns during a generation of magnetic forces created by electrical currents passing through said wire.

12. An inductor as recited in claim 11 wherein said form is substantially tubular shaped and made of a nonconductive material.

13. An inductor as recited in claim 12 wherein said groove has a substantially rectangular shaped cross-section.

14. An inductor as recited in claim 13 further comprising:

a shroud for establishing a volume with at least a portion of said wire positioned in said volume; and

a fan for passing air through said volume to cool said wire.

15. An inductor as recited in claim 14 wherein said wire extends from a first end to a second end and said inductor further comprises a first clamp mounted on said form for clamping said first end and a second clamp mounted on said form for clamping said second end.

16. An inductor as recited in claim 15 wherein said tube is formed with a cylindrical inner surface; said inner surface is distanced from said tube axis by a radial distance, R; said first end is clamped by said first clamp at a first clamping point distanced from said tube axis by a radial distance, r, with $r > R$.

17. An inductor as recited in claim 16 further comprising a saddle made of a non-magnetic material for mounting said first clamp to said form.

18. A method for manufacturing an inductor, said method comprising the steps of:

providing a nonconductive, tubular form having an outer surface and defining a tube axis;

forming a groove in said outer surface, said groove extending substantially helically about said tube axis; and

winding a wire around said form with at least a portion of said wire disposed in said groove to maintain said wire in a predetermined shape during a generation of magnetic forces created by electrical currents passing through said wire.

19. A method as recited in claim 18 further comprising the steps of:

providing a shroud for establishing a volume;

positioning at least a portion of said wire in said volume; and

circulating a fluid in said volume to cool said wire.

20. A method as recited in claim 19 further comprising the step of clamping an end of said wire to said form.